

***TSUGA HETEROPHYLLA - PSEUDOTSUGA MENZIESII /
POLYSTICHUM MUNITUM - DRYOPTERIS EXPANSA***

western hemlock - Douglas-fir / sword fern - spreading woodfern

Abbreviated Name: TSHE-PSME/POMU-DREX

Synonym: *Tsuga heterophylla - Pseudotsuga menziesii /
Polystichum munitum - Dryopteris austriaca*

Sample size = 63 plots

DISTRIBUTION: This association occurs throughout the Puget Trough. Relatively rare in San Juan County where it is largely replaced by THPL-ABGR/POMU. Also occurs in adjacent western Washington ecoregions and in southwestern BC.

GLOBAL/STATE STATUS: G3S3. Natural-origin occurrences in the Puget Trough are rare due to historic logging. Development and non-native species are threats in the Puget Trough. More common in adjacent ecoregions where most natural-origin stands have been harvested.

ID TIPS: If located within the Olympic Mountains rainshadow (see Introduction), western hemlock must be >25% cover or more abundant than western redcedar and grand fir. Sword fern dominates understory with little to no salal, evergreen huckleberry, Pacific rhododendron, or dwarf Oregon grape. Spreading woodfern, lady-fern, threeleaf foamflower, salmonberry and deerfern cumulatively more abundant than dwarf Oregon grape and oceanspray.

ENVIRONMENT: These sites are moist to very moist and appear to be relatively nutrient-rich. A variety of topography and soils are represented. Aspect is more commonly northerly or easterly. Lower slopes predominate. Also present on riparian terraces, which were rarely sampled for this work. Parent materials are variable. Silt loam and gravelly loam were the most commonly mapped soil textures, though a wide variety of textures occurs on these sites. This type is rare in dry climatic zones.

Precipitation: 26-90 inches (mean 50)

Elevation: 50-1600 feet

Aspect/slope: all/ 0-80% (mean 28)

Slope position: lower, mid, short, plain, bottom, upper

Soil series: Ahl, Alderwood, andic xerochrepts, aquic fluvoquents, Barneston, Buckpeak, Cagey, Chuckanut, dystric xerorthents, Elwha, Hoodsport, Hoogdal, Indianola, Kilchis, Kitsap, Laxton, Louella, Nati, Nisqually, Olympic, Revel, Scamman, Schneider, Skipopa, Squalicum, Swinomish, Terbies, Tokul, Whidbey, Whistle, Wilkeson, Yelm

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Vegetation Composition Table (selected species):

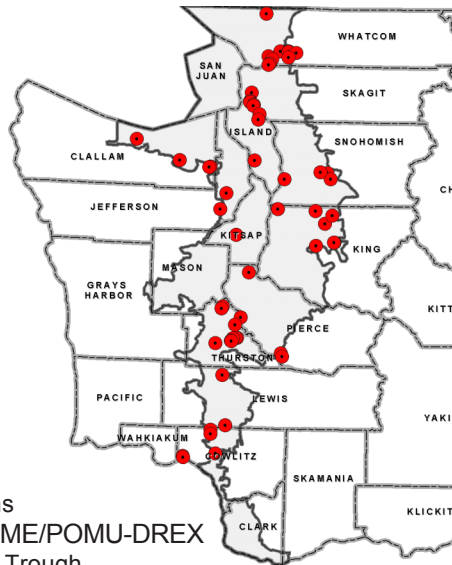
Con = constancy, the percent of plots within which each species was found;
Cov = cover, the mean crown cover of the species in plots where it was found.

Trees	Kartesz 2003 Name	Con	Cov
western hemlock	<i>Tsuga heterophylla</i>	96	36
Douglas-fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	94	45
western redcedar	<i>Thuja plicata</i>	81	33
bigleaf maple	<i>Acer macrophyllum</i>	73	18
red alder	<i>Alnus rubra</i>	44	9
grand fir	<i>Abies grandis</i>	32	14
Shrubs, Subshrubs			
red huckleberry	<i>Vaccinium parvifolium</i>	86	3
dwarf Oregon grape	<i>Mahonia nervosa</i>	54	4
trailing blackberry	<i>Rubus ursinus</i> var. <i>macropetalus</i>	68	3
red elderberry	<i>Sambucus racemosa</i> var. <i>racemosa</i>	60	2
salmonberry	<i>Rubus spectabilis</i> var. <i>spectabilis</i>	48	4
salal	<i>Gaultheria shallon</i>	46	2
vine maple	<i>Acer circinatum</i>	41	20
beaked hazelnut	<i>Corylus cornuta</i> var. <i>californica</i>	29	3
Graminoids			
Columbia brome	<i>Bromus vulgaris</i>	21	2
Dewey's sedge	<i>Carex deweyana</i> var. <i>deweyana</i>	21	2
Forbs and Ferns			
sword fern	<i>Polystichum munitum</i>	100	54
spreading woodfern	<i>Dryopteris expansa</i>	78	3
sweet-scented bedstraw	<i>Galium triflorum</i>	71	2
western starflower	<i>Trientalis borealis</i> ssp. <i>latifolia</i>	59	1
lady-fern	<i>Athyrium filix-femina</i> ssp. <i>cyclosorum</i>	54	2
threeleaf foamflower	<i>Tiarella trifoliata</i> var. <i>trifoliata</i>	54	5
western trillium	<i>Trillium ovatum</i> ssp. <i>ovatum</i>	51	1
bracken fern	<i>Pteridium aquilinum</i> var. <i>pubescens</i>	38	3
deerfern	<i>Blechnum spicant</i>	24	2
inside-out flower	<i>Vancouveria hexandra</i>	22	7

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Chris Chappell photo



Plot locations
of TSHE-PSME/POMU-DREX
in the Puget Trough

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DISTURBANCE/SUCCESSION: Fire is the primary natural disturbance. Old-growth stands show evidence of past low- to moderate-severity fire (underburns). Hemlock and/or redcedar increase over time in absence of disturbance, Douglas-fir decreases. Young stands may have little hemlock or redcedar. Red alder may regenerate abundantly after disturbance if a seed source is present and mineral soil is exposed. This can result in conversion of this association to ALRU/POMU. Alder will typically die out after 80-100 years. Salmonberry and several forbs may increase in abundance after ground surface disturbance.

VEGETATION: Canopy dominated by western hemlock, Douglas-fir, and/or western redcedar. Western hemlock is almost always present. Bigleaf maple usually forms a prominent lower canopy layer, and red alder less frequently so in natural-origin stands. Grand fir is occasionally prominent. Sword fern almost always dominates the understory, and is taller than average in this association. Vine maple forms a prominent to dominant tall shrub layer on about half the plots. Red huckleberry, dwarf Oregongrape, trailing blackberry, red elderberry, salmonberry, sweet-scented bedstraw, western starflower, spreading woodfern, threeleaf foamflower, and lady-fern are frequent in smaller amounts. Inside-out flower is prominent on about 1/4 of plots, especially from Lewis County south.

CLASSIFICATION NOTES: Described by Chappell (1997) as TSHE/POMU-ATFI and by Chappell (2001) as PSME-TSHE/POMU-DREX. NatureServe (2004) taxonomy is in need of revision: names there include TSHE/POMU-TITR or PSME-TSHE/POMU. This association is similar to TSHE/POMU-TITR of Mount Baker-Snoqualmie (Henderson et al. 1992) and Olympic (Henderson et al. 1989) national forests and TSHE/ATFI of Gifford Pinchot National Forest (Topik et al. 1986).

MANAGEMENT NOTES: Red alder can regenerate abundantly after logging of this association. These sites are very productive for tree growth. Non-native English ivy (*Hedera helix*) does well on these sites and if present can quickly overwhelm the native understory. Herb Robert (*Geranium robertianum*) is another threatening invasive for this association.

BIODIVERSITY NOTES: State threatened western wahoo (*Euonymus occidentalis*) and state sensitive tall bugbane, (*Cimicifuga elata*) occur in this plant association.